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ing a bust of Lobachévski in the park bearing his name in front of the University edifice in Kazán, the remainder of the cost to be borne by the Municipal Council.

A special committee, consisting of representatives of the Municipal Council and of the Physico-Mathematical Society, has made a contract with Mlle. Dillon, who engages for 3,000 roubles to furnish a bronze bust of Lobachévski, to be placed on a granite pedestal, the height of the monument to exceed 3 mètres.

It is hoped to unveil the bust between the 15th and the 25th of September, 1896.

This 'fête mathématique' will follow the 'congrès des savants russes naturalistes et mathématiciens' at Kiev from 1st to 12th of September, 1896, and be during the grand Russian Exposition artistic and industrial at Nijny-Novgorod in the summer and autumn of 1896. Foreigners in any way identified with the name of Lobachévski are invited to the fête, and such as accept will be the guests of the city and University of Kazán.

For a second bust of Lobachévski to be placed in the Assembly Hall of the University, 200 roubles have been given from the Lobachévski fund, the remainder of the cost to be borne by the professors of the University.

The remainder of the sum already collected (640 r., 95 k.) will be added to the fixed capital. The augmentation of the capital will permit of a new edition of Lobachévski's works in a few years, the first volume of the Kazán edition having already become rare (out of print).

The Physico-mathematical Society of Kazán has already received a large number of works and memoirs relating to Lobachévski and non-Euclidean geometry, and now having added its own collection of the printed and manuscript works of Lobachévski, the Society has inaugurated a separate library under the name *Bibliotheca Lobachévskiana*.

It is hoped that in time this library will collect all the literature of non-Euclidean geometry and be an indispensable aid to those engaged in its development.

All writers on this fecund subject are begged to send to this library copies of their works.

Alas! That the Mathematico-physical Society of Hungary, a country having an equal claim to all the honors of the non-Euclidean geometry through the genius of Bolyai János, should have been content with placing in 1894 a monumental stone on his long neglected grave in Maros-Vásárhely! GEORGE BRUCE HALSTED.

AUSTIN, TEXAS.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.

THE sixteenth annual convention of the American Society of Mechanical Engineers was held December 3d to 6th, inclusive, in New York, at the house of the Society, No. 12 W. 31st St., the old home of the Academy of Music. The program included the presentation of 13 papers, mainly by members of the faculties of various schools of mechanical engineering, although the most notable papers were, perhaps, usually those of well-known practitioners. Many interesting and instructive 'topical discussions' took place also; and these usually brought out the most extended debates.

The papers of Messrs. McElroy and Webber were devoted to the discussion of the extent, availability and probable costs of power derivable from the Caratunk Falls on the Kennebec and the subject 'Water Power; its Generation and Transmission,' and were rich in valuable data and statistics of immediate use to the engineer and hydraulician. Mr. Emery gave a brief account of his work of rearranging the machinery and apparatus of a great oil refinery at Bayonne, by improving which he had saved already 32,000 tons of fuel *per annum*,

and is still effecting further gains. The methods adopted involved extensive utilization of exhaust steam and a limited application of electric power distribution. This was the most striking and suggestive paper of the week. The same writer discussed 'Comparative tests of Steam Boilers with different kinds of Coal;' showing that much uncertainty still exists in regard to the exact calorific value of the various elements of the fuels, and their mutual influence as burned in the fire-box of the steam boiler, and also in regard to the relation between the results of test in that manner and those obtained by the use of the various 'calorimeters,' bomb and other. The earlier work of Mr. Kent was the basis of the discussion largely.

Prof. Kingsbury's account of his experiments upon the friction of screws, by use of an ingenious and well-designed automatic apparatus of his own construction, interested the convention and gave rise to considerable discussion. Carrying pressures up to 10,000 and to 14,000 pounds on the square inch, he found coefficients ranging from three to twenty-five per cent., but showed that moderate values could be secured by the combination of proper metals in well-proportioned and accurately-formed journals and bearings. He proved that the heavy mineral oils, and especially those to which a small amount of graphite had been added, were best. With the latter a coefficient as low as three per cent. had been obtained. The testing apparatus was a modification of Prof. Thurston's oil-testing machine, in which the tremendous pressures on the square-threaded screws employed were carried in such manner as not to cause appreciable inaccuracy.

Prof. Goss described tests of the DeLaval Steam-Turbine, giving the horse-power hour on about fifty pounds of steam, a figure far above that usually claimed for that class of machine, and three times as

high as the reported best record. Prof. Bissell described an ingenious recording device for testing machines and Prof. Carpenter discussed Sibley College experiments on the effects of heat upon strength of iron and steel; effects which were stated, in the course of the discussion, to have been also shown in the course of the more extended experiments of German investigators.

Prof. Barr's paper on the proportions of high-speed engine summarized his work in comparison of the proportions adopted by the principal builders, and showed that their practice covered a wide range, but that the best grouped themselves about the mean rather closely. Constants were thus introduced into the rational formulas of strength of materials by the author of the paper, which were representative of the extremes of practice and of the mean, which latter are presumed to serve as a good guide in general practice. This paper attracted much attention as being a first step in the direction of reduction of the vagaries of ancient practice to a reasonable and economical basis. Its author announced that he had already commenced a similar analysis of current practice, in the proportioning of the 'low-speed' engine.

Many other papers and discussions, which cannot be here noticed, contributed greatly to the instruction and profit derived from the convention. All will appear in the next volume of the transactions. The attendance was large, about one fourth the total membership. The Society, organized in 1880, now numbers about 1750 members and includes substantially all of the leading members of the profession. A novel and important feature of the convention was the appointment, at the request of the Superintendent of Buildings, of a committee to coöperate with architects and representatives of the building trades in the revision and improvement of the building laws. The newly elected President is the

distinguished iron master, John Fritz, the builder and manager of the famous Bethlehem Iron Works.

CURRENT NOTES ON ANTHROPOLOGY (XV.).

THE PITHECANTHROPUS ERECTUS.

IN SCIENCE, January 11, 1895, I published the first notice, in this country, of Dr. Dubois' remarkable find, in Java, of a creature intermediate between man and the apes; adding that his monograph could not fail to excite wide attention. This was so decidedly the case, so many articles appeared for and against the accuracy of his statements and conclusions, that the Dutch government sent for him to come in person and bring all his specimens to the International Zoölogical Congress in Leyden, in October last. He punctually appeared, with a large number of mammalian bones from the formation in which the Pithecanthropus was found, and an additional tooth of the animal itself.

The geological experts present decided that the various bones indicated the oldest pleistocene or else the youngest pliocene. The anatomists expressed themselves about the skull, teeth and femur of the alleged 'missing link.' Professor Virchow, probably the most conservative, maintained that the bones were of an ape; but an ape generically distinct from any known; and if the skull and femur belonged to the same individual then it was an erect ape, walking like a man; but he would not acknowledge that it bridged the gap between the anthropus and the anthropoid.

Practically the same result was reached by the eminent French anatomist, Dr. Manouvrier. He studied the originals in the possession of Dr. Dubois; and he declares there can be no doubt that in them we see the remains of a creature intermediate between man and the ape, walking erect, with a cranium like that of the gibbons, but much larger than any existing gibbon.

The conclusion is indisputable that in the Pithecanthropus we have an animal higher than the highest ape and lower than the lowest man.

AFFINITIES OF THE CHACO LANGUAGES.

DR. S. A. LAFONE QUEVEDO, well known for his studies of the native tongues of the Argentine Republic, has lately published some of his results in a paper entitled 'Las Migraciones de los Indios en la America Meridional.' The theory he advocates briefly is that the Kechua, the Aymara, the Araucan, Cacan, Guaycuru and Guarani are fundamentally much less different than has been supposed; that, allowing for phonetic changes, and adventitious and local forms, they have so much underlying similarity that we should regard them as developments from a common, ancient speech. To support this opinion, he lays much stress on the words for water, river, rain, etc., and on the personal pronouns.

Much more evidence will have to be presented before this opinion will be accepted. It is in conflict with the views of nearly all previous scholars. On the other hand, all will welcome the special studies of the same writer on the Chaco dialects. He has in press an extended grammar of the Abipone, and is engaged on another of the Mbaya and a third of the Payaguá. He has reached the conviction that the Vilela and Lule are the only two non-Guaycuru languages in the Argentine Chaco. If this is so it simplifies amazingly the extremely complicated ethnography of that region.

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SCIENTIFIC NOTES AND NEWS.

ASTRONOMICAL.

MEASUREMENT of the photographic plates taken for the purpose of making an accurate catalogue of all the stars in the heavens has decidedly gone beyond the preliminary stage.